

RELATED PATENT DATA

This patent application is a continuation resulting from U.S. Patent Application Serial No. 08/993,663, which was an application filed on December 18, 1997.

In the Claims

Cancel claims 1-50.

Add the following new claims 51-75.

51. A method of forming a transistor gate comprising:
forming a gate oxide layer over a semiconductive substrate;
providing at least one of fluorine or chlorine within the gate oxide layer; and
forming a gate proximate the gate oxide layer after the providing.

52. The method of claim 51 wherein the chlorine is provided in the gate oxide layer to a concentration of from about 1×10^{19} atoms/cm³ to about 1×10^{21} atoms/cm³.

53. The method of claim 51 wherein the gate comprises opposing lateral edges and a central region therebetween, the chlorine being provided within the gate oxide layer to a greater concentration proximate at least one of the gate edges than in the central region.

54. The method of claim 51 wherein the providing comprises providing fluorine.

55. A method of forming a transistor gate comprising:
forming a gate and a gate oxide layer in overlapping relation, the gate having opposing edges and a center therebetween, the gate oxide having a center and outwardly exposed opposing edges laterally aligned with the edges of the gate; and
concentrating at least one of chlorine or fluorine in the gate oxide layer within the overlap more proximate at least one of the outwardly exposed oxide gate edges than the center.

56. The method of claim 55 wherein the concentrating comprises concentrating fluorine.

1 57. The method of claim 55 wherein the gate is formed to have
2 a gate width between the edges of 0.25 micron or less, the concentrating
3 forming at least one concentration region in the gate oxide which
4 extends laterally inward from the at least one gate edge no more than
5 about 500 Angstroms.

6
7 58. The method of claim 55 wherein the concentrating comprises
8 diffusion doping.

9
10 59. The method of claim 55 wherein the concentrating comprises
11 ion implanting.

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13 60. The method of claim 55 wherein the removing comprises
14 removing portions of the gate oxide layer not overlapping the gate.

15
16 61. The method of claim 55 wherein the concentrating follows
17 the removing.

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62. A method of forming a transistor gate comprising:
forming a gate and a gate oxide layer in overlapping relation, the
gate having opposing edges and a central region therebetween;
forming sidewall spacers comprising at least one of the chlorine or
fluorine proximate the opposing edges; and
doping the gate oxide layer within the overlap with at least one
of chlorine or fluorine proximate the opposing gate edges and leaving
the central region substantially undoped with chlorine and fluorine.

63. The method of claim 62 wherein the doping provides a
dopant concentration in the gate oxide layer proximate the edges from
about 1×10^{19} atoms/cm³ to about 1×10^{21} atoms/cm³.

64. The method of claim 62 further comprising removing portions
of the gate oxide layer not overlapping the gate.

65. The method of claim 62 wherein the doping comprises
diffusion doping at least one of chlorine or fluorine from the spacers
into the gate oxide layer.

66. The method of claim 65 further comprising annealing the
spacers to provide the diffusion doping.

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1 67. The method of claim 62 wherein the doping comprises
2 doping with fluorine.

3
4 68. A method of forming a transistor gate comprising the
5 following sequential steps:

6 forming a gate over a gate oxide layer, the gate having opposing
7 lateral edges;

8 forming sidewall spacers comprising at least one of chlorine or
9 fluorine proximate the opposing lateral edges; and

10 diffusion doping at least one of chlorine or fluorine into the gate
11 oxide layer beneath the gate from laterally outward of the gate edges.

12
13 69. The method of claim 68 wherein the doping provides a
14 dopant concentration in the gate oxide layer proximate the edges from
15 about 1×10^{19} atoms/cm³ to about 1×10^{21} atoms/cm³.

16
17 70. The method of claim 68 wherein the doping provides a pair
18 of spaced and opposed concentration regions in the gate oxide which
19 extend laterally inward from the gate edges no more than about
20 500 Angstroms.

1 71. The method of claim 68 wherein the doping provides a pair
2 of spaced and opposed concentration regions in the gate oxide which
3 extend laterally inward from the gate edges no more than about
4 500 Angstroms, the concentration regions having an average dopant
5 concentration in the gate oxide layer proximate the edges from about 1×10^{19} atoms/cm³ to about 1×10^{21} atoms/cm³.
6
7

8 72. The method of claim 71 wherein the gate oxide layer
9 between the concentration regions is substantially undoped with chlorine
10 and fluorine.
11

12 73. The method of claim 68 further comprising removing portions
13 of the gate oxide layer not beneath the gate.
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15 74. The method of claim 68 wherein the diffusion doping
16 comprises annealing the sidewall spacers.
17

18 75. The method of claim 68 wherein the diffusion doping
19 comprises diffusion doping fluorine.
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